IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF PENNSYLVANIA

THE TRUSTEES OF THE UNIVERSITY OF PENNSYLVANIA, Plaintiff,	:	
v.	:	**Civ. No. 15-6133**
ELI LILLY AND COMPANY, et al., Defendants.	:	

O R D E R

Plaintiff, The Trustees of the University of Pennsylvania, allege that the administration of Erbitux followed by radiation infringed upon U.S. Patent No. 7,625,558 (the '558 Patent). (Doc. No. 1 at ¶¶ 23, 46, 52, 58.) Claim 13 of the '558 Patent is the sole remaining asserted claim. (Doc Nos. 63-15, 82.) Defendants move for summary judgment of invalidity (Doc. No. 180), summary judgment of noninfringement (Doc. No. 181), and partial summary judgment of no willful infringement. (Doc. No. 182.) For the reasons that follow, I will deny Defendants' Motions in their entirety.

I. BACKGROUND

Penn filed its patent application on July 8, 1998, describing "methods of treating an individual who has an erbB protein mediated tumor." (Doc. No. 1 at ¶ 16, Doc. No. 1; '558 Patent at 1, Doc. No. 1-1.) On December 1, 2009, the United States Patent and Trademark Office issued to Penn Patent Number 7,625,558 containing claims for methods of treating cancerous tumors by "administering a cytostatic antibody that inhibits tumor cell growth," and by then exposing that cell to radiation. (Doc. No. 1 at ¶ 17; '558 Patent.)

Erbitux, which is manufactured and sold by Defendants, is an FDA approved treatment for

Squamous Cell Carcinoma of the Head and Neck (SCCHN). (Doc. No. 1-2). The active ingredient in Erbitux is Cetuximab, an antibody that binds to epidermal growth factor receptor (EGFR), which is an erbB-family protein. (Id.; Doc. No 206 at ¶ 21.) The Erbitux label states that it is "indicated in combination with radiation therapy." (Doc. No. 183 at ¶ 68.)

On November 13, 2015, Penn brought this action, alleging Defendants infringe "at least" 35 of the '558 Patent's 41 Claims by marketing and selling Erbitux. (Doc. No. 1 at ¶ 45, 46.) The matter was assigned to Judge Robert Kelly. Penn did not explicitly allege infringement of Claims 8, 13, 15, 18, 31, or 41. (Id.) Defendants filed a Petition for an *inter partes* review (IPR) at the USPTO of Claims 1-7, 9-12, 14, 16, 17, and 19-31 of the '558 Patent, and this case was stayed during the IPR proceedings and following appeals before the USPTO and Federal Circuit. (Doc. Nos. 23, 60, 62.) The Patent Trial and Appeal Board invalidated each of the challenged claims in the IPR. (Doc. No. 61-1 at 59.) Additionally, Judge Kelly granted Defendants' Motion to Dismiss as to Penn's assertion of infringement of Claims 32-40 of the '558 Patent as being improper multiple dependent claims. (Doc. Nos. 52, 53.) Each of Penn's originally asserted claims were thus either invalidated or dismissed.

On November 8, 2018, Penn filed a Motion for Leave to Amend Infringement Contentions, seeking to include Claim 13. (Doc. No. 63.) Explaining why it had not previously asserted Claim 13, Penn offered an article by Fournier et al., first published on April 20, 2018 (Fournier). (Doc. No. 63-2 at ¶¶ 20-24.) Penn stated that before publication of Fournier it "had no reason to expect . . . that treatment with the Erbitux antibody would affect kinase activity mediated by a p185 homodimer." (Id. at ¶ 24.) Based on the known mechanisms of Erbitux, however, and the new findings in Fournier regarding EGFR heterodimer formation, "it follows that Erbitux treatment would be expected to inhibit kinase activity mediated by a p185 homodimer." (Id.)

Judge Kelly granted Penn's Motion for Leave to Amend Infringement Contentions. (Doc. No. 74.) Accordingly, Claim 13, which depends from Claim 11, is the sole remaining asserted Claim. Claims 11 and 13 recite:

> **11.** A method for inhibiting proliferation of a tumor cell, said tumor cell being from an erbB mediated tumor, which method comprises of:
>
> (a) contacting the cell with an antibody that disrupts erbB kinase activity said disruption having a cytostatic effect on the tumor cell; and
>
> (b) thereafter exposing the tumor cell to an effective amount of anti-cancer radiation.
>
> **13.** The method according to claim **11** wherein the antibody inhibits kinase activity mediated by a p185 homodimer.

Defendants seek summary judgement that Claim 13 of the '558 Patent is invalid for failing to comply with the written description and enablement requirements (Doc. No. 180), summary judgment of noninfringement (Doc. No. 181), and partial summary judgment of no willful infringement. (Doc. No. 182.)

II. LEGAL STANDARD

Upon motion of any party, summary judgment is warranted "if there is no genuine issue as to any material fact and the moving party is entitled to judgment as a matter of law." Fed. R. Civ. P. 56(a). The moving party must show the absence of any genuine issue of material fact. Celotex Corp. v. Catrett, 477 U.S. 317, 323 (1986). An issue is material only if it could affect the result of the suit under governing law. Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 248 (1986). I "must view the facts in the light most favorable to the non-moving party," and make every reasonable inference in that party's favor. Hugh v. Butler Cnty. Family YMCA, 418 F.3d 265, 267 (3d Cir. 2005).

"[A]t the summary judgment stage the judge's function is not himself to weigh the evidence and determine the truth of the matter but to determine whether there is a genuine issue for trial." Anderson, 477 U.S. at 249. Nor can I resolve factual disputes or make credibility determinations. Big Apple BMW, Inc. v.

BMW of N. Am., Inc., 974 F.2d 1358, 1363 (3d Cir. 1992). If I determine that the moving party is entitled to judgment as a matter of law, I must grant summary judgment in that party's favor. Celotex, 477 U.S. at 322.

III. DISCUSSION

A. Invalidity

Defendants seek summary judgment that Claim 13 of the '558 Patent is invalid for failing to comply with both the written description and enablement requirements. (Doc. No. 180.) An issued patent is presumed valid. 35 U.S.C. § 282(a). A defendant in a patent infringement suit may plead invalidity of the patent as a defense. 35 U.S.C. § 282(b). Because the patent holder enjoys a presumption of validity, "Defendants have the evidentiary burden to show facts supporting a conclusion of invalidity by clear and convincing evidence." Sitrick v. Dreamworks, LLC, 516 F.3d 993, 1000 (Fed. Cir. 2008).

A patent claim is invalid if it does not comply with the requirements of 35 U.S.C. § 112. 35 U.S.C. § 282(b)(3)(A). Section 112 requires that every patent include "a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same." 35 U.S.C. § 112 (2006). The Federal Circuit has held that Section 112 imposes two separate requirements: a written description requirement and an enablement requirement. Ariad Pharms., Inc. v. Eli Lilly & Co., 598 F.3d 1336, 1344 (Fed. Cir. 2010).

1. Written Description

The written description requirement under Section 112 requires that the specification "convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or

she was in possession of the invention." Vas-Cath, Inc. v. Mahurkar, 935 F.2d 1555, 1563-64 (Fed. Cir. 1991). Whether a claim is supported by adequate written description is a question of fact. Ariad, 598 F.3d at 1351. Yet, the written description test is "amenable to summary judgment in cases where no reasonable fact finder could return a verdict for the non-moving party." D Three Enters., LLC v. SunModo Corp., 890 F.3d 1042, 1047 (Fed. Cir. 2018).

The written description test "requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art. Based on that inquiry, the specification must describe an invention understandable to that skilled artisan and show that the inventor actually invented the invention claimed." Ariad, 598 F.3d at 1351. Merely pointing to the specification with a bare assertion that the claim language appears *in ipsis verbis* is insufficient to establish compliance with the written description requirement. Id. at 1349.

Claim 13 is directed to a method of inhibiting proliferation of a tumor cell by administering any antibody that meets the recited functions of disrupting erbB kinase activity thereby having a cytostatic effect and inhibiting kinase activity mediated by a p185 homodimer. Thus, Claim 13 is a "genus claim" because it "encompass[es] the use of all [antibodies] that achieve the desired result." See id. at 1341.

Patents claiming a genus by using "functional language to define the boundaries of [the] claimed genus," present a unique problem because the functional language "may simply claim a desired result . . . without describing species that achieve that result." Id. at 1349. The Federal Circuit has explained that "a sufficient description of a genus [] requires the disclosure of either a representative number of species falling within the scope of the genus or structural features common to the members of the genus so that one of skill in the art can 'visualize or recognize' the members of the genus." Id. at 1350 (quoting Regents of the Univ. of Cal. v. Eli Lilly & Co., 119

F.3d 1559, 1568-69 (Fed. Cir. 1997)). The necessary disclosure "required to meet the written description requirement 'varies with the nature and scope of the invention at issue, and with the scientific and technologic knowledge already in existence,'" however. Juno Therapeutics, Inc. v. Kite Pharma, Inc., 10 F.4th 1330, 1335 (Fed. Cir. 2021) (citing Capon v. Eshhar, 418 F.3d 1349, 1357 (Fed. Cir. 2005)).

Defendants argue that Claim 13 recites a method of treatment using a broad genus of antibodies, which fails the representative species test. (Doc. No. 180 at 8.) They note that the '558 Patent does not include any working examples of methods of administering an antibody that inhibits kinase activity mediated by a p185 homodimer as required by Claim 13. (Id. at 9, 11.) Yet, neither working examples nor actual reduction to practice is necessary to meet the written description requirement. Centrak, Inc. v. Sonitor Techs., Inc., 915 F.3d 1360, 1367 (Fed. Cir. 2019) (citing Ariad, 598 F.3d at 1352).

Penn responds by pointing to the Specification which describes antibodies meeting the limitations of Claim 13. (Doc. No. 208 at 12-13.) "[E]very species in a genus need not be described in order that a genus meet the written description requirement." Regents of the Univ. of Cal. 119 F.3d at 1568. There are, however, no "bright-line rules governing . . . the number of species that must be disclosed to describe a genus claim, as this number necessarily changes with each invention, and it changes with progress in a field." Ariad, 598 F.3d at 1351-52. For example, in some circumstances, disclosure of even a single representative species can satisfy the written description requirement. See, e.g., Invitrogen Corp. v. Clontech Lab'ys, Inc., 429 F.3d 1052, 1073 (Fed. Cir. 2012). In other instances, disclosure of 300 species does not provide adequate written description when each species is "structurally similar" and the species "are not representative of the full variety or scope of the genus." AbbVie Deutschland GmbH & Co. v. Janssen Biotech,

Inc., 759 F.3d 1285, 1291, 1300 (Fed. Cir. 2014) (Each disclosed species was a derivative of a lead antibody and were therefore structurally similar while the alleged infringing antibody, although within the scope of the claimed genus, was 50% or less similar to any disclosed species.).

The Parties dispute how many species are disclosed in the Specification itself. Defendants point only to the experimental examples, alleging that they are insufficient to satisfy the "representative species test." (Doc. No. 223 at 4-5.) Penn responds that the '558 Patent Specification "cites to at least monoclonal antibodies 528, 425, 7.16.4, 4C8, 4D5, 3E8, and 3H4." (Doc. No. 208 at 7); '558 Patent at 24:37-44. Defendants do not acknowledge these species, nor do they provide any evidence that these species are not representative of the entire genus.

Viewing this evidence in the light most favorable to Penn, a jury could reasonably conclude that the '558 Patent describes a representative number of species such that one of ordinary skill in the art would recognize that the inventors had possession of the invention. If so, the '558 Patent provides adequate written description under Section 112.

In these circumstances, I will deny Defendants' Motion for Summary Judgment of Invalidity on the basis of failure to comply with the written description requirement under Section 112.

2. Enablement

The enablement requirement under Section 112 requires that the Specification provide sufficient information as to enable one of ordinary skill in the art to "to make and use" the claimed invention. 35 U.S.C. § 112; Ariad, 598 F.3d at 1345. "Whether a claim satisfies the enablement requirement . . . is a question of law . . . based on underlying facts." Sitrick, 516 F.3d at 999. "Whether claims are sufficiently enabled by a disclosure in a Specification is determined as of the date that the patent application was first filed." Enzo Biochem, Inc v. Calgene, Inc, 188 F.3d 1362,

1371 (Fed. Cir. 1999). The enablement requirement is met where "one skilled in the art, after reading the specification, could practice the claimed invention without undue experimentation." Sitrick, 516 F.3d at 999 (citing AK Steel Corp. v. Sollac, 344 F.3d 1234, 1238-39 (Fed. Cir. 2003)).

Whether undue experimentation is needed is not a single, simple factual determination, but rather is a conclusion reached by weighing many factual considerations. In re Wands, 858 F.2d 731, 737 (Fed Cir. 1998). The Federal Circuit has set forth several factual inquiries to consider when determining if practicing the invention would require undue experimentation:

> (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.

Id. Further, the Specification must enable full scope of the claims to meet the requirements under Section 112. Sitrick, 516 F.3d at 999 ("Enabling the full scope of each claim is 'part of the quid pro quo of the patent bargain.'").

A claim reciting a method of treatment by administering a therapeutic agent does not comply with the enablement requirement if the specification discloses only a single species and the state of the art is relatively undeveloped. Compare Wyeth & Cordis Corp. v. Abbott Lab'ys, 720 F.3d 1380, 1385-86 (Fed. Cir. 2013) (finding a claim for treating restenosis by administering rapamycin invalid when the specification disclosed only a single species and only four other analogs were known at the time of the invention) with Erfindergemeinschaft UroPep GbR v. Eli Lilly & Co., 276 F. Supp. 3d 629, 662 (E.D. Tex. 2017) (aff'd per curiam) (denying judgment as a matter of law that a claim for treating hyperplasia by administering a phosphodiesterase (PDE) V inhibitor was not enabled in part because "the research field . . . was mature"). Moreover, synthesizing and testing "at least tens of thousands of candidate compounds constitutes undue experimentation," even if such experimentation is routine. Wyeth, 720 F.3d at 1385-86.

Nevertheless, "'[e]ven a considerable amount of experimentation is permissible,' as long as it is 'merely routine' or the specification 'provides a reasonable amount of guidance' regarding the direction of experimentation." Id. at 1386 (quoting John Hopkins Univ. v. CellPro, Inc., 152 F.3d 1342, 1360-61 (Fed. Cir. 1998)); see also UroPep, 276 F. Supp. 3d at 662-63 ("In the context of a disclosure and a field that provides no guidance, aimless plodding through systematic experimentation of a single compound that would take weeks may be undue.")

Defendants' expert acknowledged that practicing clinicians would have known how to administer an antibody followed by radiation. (Doc. No 213-29 at 144:17-22, 145:3-11.) Defendants non-enablement assertion thus focuses on two arguments: (1) identifying antibodies encompassed by the method of claim 13 would require undue experimentation, and (2) practicing the invention on *any* erbB-mediated tumor would require undue experimentation. (Doc. No. 180 at 15-16.)

Defendants' argue that the '558 patent identifies the antibody using functional characteristics—(1) it disrupts erbB kinase activity, (2) it has a cytostatic effect, and (3) it inhibits kinase activity mediated by a p185 homodimer—but does not describe the antibody itself, and that it would require undue experimentation to identify antibodies meeting those functional characteristics. (Id. at 16.) However, the Parties' dispute how much experimentation would be needed to enable the full scope of the antibodies of Claim 13.

First, the Parties dispute the state of the art. Defendants' expert acknowledged that as of 1998 "there were a large number of possible antibodies [against p185] that could be used" in the method of Claim 13. (Doc. No. 213, Exh. 36, 135:7-17.) Plaintiff's expert recognized that one would "have to actually do [a] test" to determine if a particular antibody has the required functional characteristics. (Doc. No. 186, Exh. 3, 146:1-15.) Nevertheless, the Parties' agree that techniques

existed in 1998 to determine whether an antibody had the recited functions. (Doc. No. 213, Exh. A, 208-216.)

The Parties also dispute the applicability of the working examples. Defendants contend that of the eight working examples, only examples 5 and 8 include radiation, but without the use of an antibody. (Doc. No. 193, ¶ 11). Penn responds that these examples are relevant to Claim 13 as they use radiation in combination with a genetic mutation and peptidomimetic, and that a "POSA would have understood that the results . . . would also apply to antibodies." (Doc. No. 221, ¶ 11).

Defendants further argue that the evidence demonstrates "it can take *decades* to determine whether a single antibody meets the claim requirements." (Doc. No. 190.) Defendants point to Erbitux, the alleged infringing product, which predates the '558 Patent, and assert that even Penn did not know it possessed the claimed functional activity. (Doc. No. 190.) As Penn counters, however, Defendants were the exclusive licensees of Erbitux and had not published any literature indicating the antibody's effects. (Doc. No. 208, Exh. 48, ¶ 67.) Further, Defendants have not set forth any evidence that testing Erbitux to determine whether it had the claimed functionality would require undue experimentation. See McRO, Inc. v. Bandai Namco Games Am. Inc., 959 F.3d 1091, 1100-01 (Fed. Cir. 2020) ("Conducting the Wands analysis has routinely involved concrete identification of at least some embodiment or embodiments asserted not to be enabled . . . and how much experimentation a skilled artisan would have to undertake to make and use those products or processes.")

Viewing this evidence in the light most favorable to Penn, a jury could reasonably find that the state of the art was advanced, that the Specification gave significant guidance on how to identify and select an antibody having the recited functions, and that the working examples are

relevant to Claim 13. If so, it would not require undue experimentation to identify antibodies for use in the method of Claim 13.

Defendants also argue that Claim 13 encompasses a "dizzying array of human cancers," the full scope of which is not enabled. (Doc. No. 190.) As defined in the Markman Order, Claim 13 is a method for inhibiting proliferation of a tumor cell from a tumor "whose transformed phenotype is associated with tyrosine kinase activity by one or more members of the erbB family of receptors." (Doc. No. 158 at 9.) Although the specification must enable full scope of the claims, a narrow disclosure may enable a broader claim scope if there is a "reasonable correlation between the narrow disclosure in [the] specification and the broad scope of protection sought." In re Vaeck, 947 F.2d 488, 495 (upholding rejection of a patent application as lack of enablement because the genus included more than 150 species in a highly unpredictable and relatively poorly studied area).

Although Parties' do not dispute that as of 1998, there were techniques available to determine if a tumor was "erbB-mediated," they disagree on the unpredictability and breadth of the claims. (Doc. No. 213, Exh. A, 208-216.) Defendants point to one of the '558 Patent inventors' testimony that "you just can't extrapolate from a colon cell to a lung tumor cell." (Doc. No. 186-7 at 70:12-14.) Penn characterizes this statement as merely demonstrating that "not every cancer will be driven by erbB activity." (Doc. No. 208 at 23.) Additionally, Penn points to the Specification, which "identifies multiple types of erbB-mediated tumors." (Doc. No. 213, Exh. 36 at ¶ 9.) Defendants have not pointed to any undisputed evidence that "erbB mediated tumors" are poorly understood or have significantly varying characteristics.

Viewing this evidence in the light most favorable to Penn, a jury could reasonably find that the "erbB-mediated" language serves to limit the types of cancer encompassed by the method of Claim 13 and that there is a correlation between the information in the '558 Patent Specification

and the breadth of the claims. Moreover, a jury could find that the Specification gives guidance on how to identify an erbB-mediated tumor. If so, it would not require undue experimentation to identify tumors within the scope of Claim 13.

Because the jury could find that the Specification provides significant guidance, that the working examples are relevant to the method of Claim 13, and that any experimentation necessary would be merely routine, Defendant has not met its high burden of establishing with clear and convincing that it would require undue experimentation to make and use the invention of Claim 13.

In these circumstances, I will deny Defendants' Motion for Summary Judgment of Invalidity on the basis of failure to comply with the enablement requirement under Section 112.

B. Noninfringement

Penn asserts that Defendants' product, Erbitux, infringes Claim 13 of the '558 patent. In its infringement contentions, Penn advances a theory of induced infringement. It asserts that the Erbitux package insert directs physicians to administer Cetuximab, the antibody in Erbitux, and then administer radiation. Defendants seek summary judgment of noninfringement. (Doc. No. 181.) They argue that Erbitux does not directly infringe Claim 13 and that, even if Erbitux does infringe Claim 13, Defendants did not induce infringement.

Anyone who "without authority makes, uses, offers to sell, or sells any patented invention, within the United States . . . infringes the patent." 35 U.S.C. § 271. "A patentee [] bears the burden of proving infringement." Medtronic, Inc. v. Mirowski Fam. Ventures, LLC, 571 U.S. 191, 193 (2014). Infringement is a question of fact. Electro Sci. Indus., Inc., v. Dynamic Details, Inc., 307 F.3d 1343, 1347 (Fed. Cir. 2002). Granting a motion for summary judgment of noninfringement is thus unwarranted "if the record shows some evidence supporting a finding of noninfringement

and some evidence to the contrary." AFG Indus., Inc., v. Cardinal IG Co., 375 F.3d 1367, 1371 (Fed. Cir. 2004). I may not grant summary judgment when there are "questions of scientific and evidentiary fact that are material to the issue of infringement." Scripps Clinic & Rsch. Found. v. Genentech, Inc., 927 F.2d 1565, 1582 (Fed. Cir. 1991).

1. Direct Infringement

Defendants argue that they are entitled to summary judgment because Penn "cannot prove that Erbitux inhibits kinase activity mediated by a p185 homodimer in squamous cell carcinoma of the head and neck." (Doc. No. 191.) Defendants first assert that the only evidence of infringement may come from the Fournier article because advancing other evidence would constitute "new theory" of infringement. (Doc. No. 225 at 1.) Defendants assert that neither Fournier, nor any other evidence put forth by Penn, establishes that Erbitux infringes Claim 13. (Doc. No. 225 at 1-2.) As I discuss below, however, there are factual disputes of whether Fournier proves that Erbitux infringes Claim 13. Accordingly, I need not determine whether Penn may rely on other evidence to prove infringement.

To determine whether an accused method infringes a claim requires two steps. Tanabe Seiyaku Co. v. U.S. Intern Trade Com'n, 109 F.3d 726, 731 (Fed. Cir. 1997). First, I must "construe the claim asserted to be infringed to determine its meaning and scope." Id. Second, I must "compare the properly construed claim to the accused product or process." Id. (citing Markman v. Westview Instruments, Inc., 52 F.3d 967, 976 (Fed. Cir. 1995)). After comparing the construed claim to the accused method, "the patentee must show that the accused device meets each claim limitation." Deering Precision Instruments, LLC v. Vector Distrib. Sys., Inc., 347 F.3d 1314, 1324 (Fed. Cir. 2003). I issued a Markman Order on February 5, 2020 construing eight terms disputed by the Parties. (Doc. No. 158.) Accordingly, to determine infringement, I must

compare the alleged infringing method—administration of Erbitux followed by radiation—to Claim 13 as construed in my Markman Order.

Claim 13 requires administration of an antibody that "inhibits the proliferation of a tumor cell . . from an erbB mediated tumor." '558 Patent at 134:33-34. Defendants argue that they are entitled to summary judgement because Penn cannot prove that administering Erbitux meets limitation of "said tumor cell being from an erbB mediated tumor." (Doc. No. 181 at 10-12.) In my Markman Order, I construed "said tumor cell being from an erbB mediated tumor" to mean "the tumor cell is from a tumor whose transformed phenotype is associated with tyrosine kinase activity by one or more members of the erbB family of receptors." (Doc No. 158 at 9.)

Defendants contend that Fournier does not establish that SCCHN (the cancer for which Erbitux is an approved treatment) is an erbB mediated tumor or that Erbitux inhibits the proliferation of cells "from an erbB mediated tumor." (Doc. No. 181 at 9-15.) Defendants point to a Fournier reviewer's comment that "the cell line used in the experiments is not representative of epithelial cancer." (Doc. No. 186, Exh. 16.) Defendants further cite an inventor's statement that "colorectal data doesn't immediately transfer onto the lung." (Doc. No. 186, Exh. 7 at 71:1-2.) Penn responds with Dr. Burgess' declaration that the "receptors will always interact in the same way no matter the cell type. The overall outcome of the cell responses to HER2 will be different in different cell types, but the biochemistry and physics and biology of the actual interactions will be similar in different cell types." (Doc. No. 222, Exh. 51, ¶ 29.) Penn also asserts that Erbitux's mechanism in one cell type would indicate its mechanism in SCCHN because it "won't work differently depending on the cell type." (Doc. No. 222, Exh. 10.)

With respect to "erbB mediated tumor" cells, Defendants argue that because the cell line used in Fournier does not express erbB proteins, it cannot establish that Erbitux inhibits the

proliferation of a cell "from an erbB mediated tumor." (Doc. No. 191.) The Parties do not dispute that the cells used in Fournier have "negligible native EGFR protein." (Doc. No. 221, ¶ 78.) Defendants interpret this as meaning Fournier is "useless . . . as evidence of infringement" because the cells used in Fournier "are not 'erbB mediated tumor' cells." (Doc. No. 191.) Penn disputes this characterization, citing Dr. Leake, Fournier's co-author, who explained that the cell type was selected to allow for observation of exogenous tagged EGFR "without interference from untagged native EGFR." (Doc. No. 222, Exh. 61, ¶ 21).

Viewing this evidence in the light most favorable to Penn, a jury could reasonably find that Fournier is representative of the mechanism of action of Erbitux in SCCHN and that the cell line used mimics an erbB-mediated tumor. If so, it would support a finding that Erbitux "inhibits the proliferation of a tumor cell . . . from an erbB mediated tumor."

Claim 13 also requires that the antibody "inhibit[] kinase activity mediated by a p185 homodimer." '558 Patent at 134:44-45. Defendants argue that they are entitled to summary judgement because Penn cannot prove that administering Erbitux "inhibits kinase activity mediated by a p185 homodimer." (Doc. No. 181 at 15-18.) In my Markman Order, I construed "inhibits kinase activity mediated by a p185 homodimer" to mean "the adding of a phosphate group by p185 to a tyrosine residue of another protein that occurs when p185 is in a homodimer." (Doc No. 158 at 8.)

Defendants point to Dr. Leake's deposition testimony that he has not "measure[d] the tyrosine kinase activity of [p185]" in the cells used in Fournier, and that Fournier did not "comment directly on [the] issue of whether Erbitux "had any [e]ffect on the tyrosine kinase activity mediated by [p185] homodimers." (Doc. No. 186, Exh. 23 at 94:3-13.) Penn again responds with Dr. Burgess' declaration that Fournier demonstrates that Erbitux "by binding to the EGFR, [] prevents

the formation of EGFR-containing dimers, and in turn prevents such EGFR-containing dimers from complexing with other dimers in higher order signaling complexes (which in turn blocks kinase activity mediated by p185 homodimers)." (Doc. No. 222, Exh. 51, ¶ 26.)

Viewing this evidence in the light most favorable to Penn, a jury could reasonably find that Fournier demonstrates that Erbitux blocks kinase activity mediated by p185 homodimers. If so, it would support a finding that Erbitux "inhibits kinase activity mediated by a p185 homodimer."

As I have discussed, a jury could find that Erbitux "inhibits the proliferation of a tumor cell . . from an erbB mediated tumor" and "inhibits kinase activity mediated by a p185 homodimer." If so, the jury could find that administering Erbitux followed by radiation directly infringes Claim 13. I will thus not grant Defendants' Motion for Summary Judgment of Noninfringement on the basis that Erbitux does not directly infringe Claim 13.

2. Induced Infringement

Section 271(b) provides that infringement occurs when an entity "actively induces infringement of a patent." 35 U.S.C. 271(b). Induced infringement "requires a predicate finding of direct infringement." BMC Res., Inc. v. Paymentech, L.P., 498 F.3d 1373, 1380 (Fed. Cir. 2007). Accordingly, having ruled that a jury could find that administering Erbitux followed by radiation directly infringes Claim 13, I must next determine whether Defendants are entitled to summary judgment of noninfringement on the basis that they did not induce infringement.

To prevail on an induced infringement theory, "the patentee must show that the accused inducer took an affirmative act to encourage infringement with the knowledge that the induced acts constitute patent infringement." Microsoft Corp. v. DataTern, Inc., 755 F.3d 899, 904 (Fed. Cir. 2014). Where, as here, inducement "relies on a drug label's instructions . . . . [t]he label must encourage, recommend, or promote infringement." Eli Lilly & Co. v. Teva Parenteral Meds., Inc.,

845 F.3d 1357, 1368 (Fed. Cir. 2017).

To meet the knowledge requirement, the patentee must demonstrate that the alleged infringer "knew of the patent and that 'the induced acts constitute patent infringement.'" Commil USA, LLC v. Cisco Systems, Inc., 575 U.S. 632, 639 (2015) (quoting Global-Tech Appliances, Inc. v. SEB S.A., 563 U.S. 754, 766 (2011)). The patentee may prove the alleged infringer's knowledge "by a showing of actual knowledge or willful blindness." Info-Hold, Inc. v. Muzak LLC, 783 F.3d 1365, 1372 (Fed. Cir. 2015). A finding of willful blindness requires two elements: (1) the defendant must subjectively believe that there is a high probability that a fact exists, and (2) the defendant must take deliberate actions to avoid learning of that fact. Global-Tech, 563 U.S. at 769. Willful blindness may be inferred from the circumstances. Id. at 770-71.

Defendants argue that they could not have had the requisite intent before November 2018 because, according to Penn, nobody knew that Erbitux inhibits the kinase activity mediated by a p185 homodimer until November 2018. (Doc. No. 219.) Defendants offer Penn's Motion to Amend filed on November 8, 2018, in which Penn cited Fournier as "new data" which supported for the first time that Erbitux binding to EGFR affected the activity of p185 homodimers. (Doc. No. 181 at 18-19.) Defendants thus argue that because "*nobody* knew that prescribing Erbitux" inhibits activity of p185 homodimers and thus infringes Claim 13 before 2018," they could not have knowingly infringed Claim 13. (Doc. No. 181 at 19.)

Penn responds argues that *it* did not know Erbitux infringed Claim 13 until November 2018, and that there is "ample evidence of Defendants' knowledge or willful blindness." (Doc. No 219 at 22). First, Defendants stipulated that Averie Hanson, IP counsel at ImClone and Lilly, became aware of the '558 Patent 5 days after it issued. (Doc. No. 199.) With respect to Defendant BMS, ImClone and BMS were parties to an agreement to develop and commercialize Erbitux in

North America between September 2001 and October 2015. (Doc. No. 183 at ¶ 145.) BMS' corporate representative did not have enough information, however, to testify as to when BMS first learned of the '558 Patent. (Doc. No. 213-24 at 270:2-15.) Viewing this evidence in the light most favorable to Penn, a jury could reasonably infer from its close relationship with ImClone, that BMS also had knowledge of the '558 Patent.

As to Defendants' knowledge that Erbitux inhibits kinase activity mediated by a p185 homodimer, Penn points to laboratory notebooks from ImClone scientist Dr. Dipa Patel and the corresponding publication "Anti-Epidermal Growth Factor Receptor Monoclonal Antibody Cetuximab Inhibits EGFR/HER-2 Heterodimerization and Activation." (Doc. No. 213, Exh. 7, 51.) The Parties disagree on the interpretation of the publication and laboratory notebook data. Defendants point to the Patel paper, which states that "activation of [p185-p185] homodimers . . . was not inhibited by [Erbitux] treatment," as evidence that they had no knowledge of Erbitux inhibited kinase activity mediated by a p185 homodimer. (Doc. No. 213, Exh. 7.) In response, Penn's expert states that data was incorrectly reported in the Patel Paper. (Doc. No. 213, Exh. 51 at ¶ 18.) Penn's expert explains that the data from Patel's notebook demonstrates that Defendants knew that Erbitux inhibited phosphorylation mediated by p185 homodimers. (Id.)

Taking this evidence in the light most favorable to Penn, a jury could reasonably infer that Defendants knew that Erbitux inhibited kinase activity mediated by a p185 homodimer. If so, Defendants would have induced infringement of Claim 13. Accordingly, I will not grant Defendants Motion for Summary Judgment of Noninfringement on the basis that Defendants did not induce infringement of Claim 13.

C. Willful Infringement

Penn asserts that Defendants willfully infringed Claim 13 of the '558 Patent. (Doc. No.

63-15.) "Willful infringement is a question of fact." Bayer Healthcare LLC v. Baxalta Inc., 989 F.3d 964, 987 (Fed. Cir. 2021). To establish willful infringement, the patentee must establish by a preponderance of the evidence that "the accused infringer had a specific intent to infringe at the time of the challenged conduct." Id. A finding of "willfulness requires deliberate or intentional infringement"—knowledge of the patent and evidence of infringement, although necessary, are insufficient. Id. at 988.

It is undisputed that Defendants Eli Lilly and ImClone had knowledge of the '558 Patent. (Doc. No. 199.) As I have discussed, a jury could reasoanably infer that Defendant BMS also had knowledge of the '558 Patent. (See Doc. No. 213-24 at 270:2-15.)

To find willfulness, knowledge of the asserted patent and evidence of infringement is not sufficient; nevertheless willfulness "requires a jury to find no more than deliberate or intentional infringement." Eko Brands, LLC v. Adrian Rivera Maynez Enters., Inc., 946 F.3d 1367, 1378 (Fed. Cir. 2020). Factors that the jury may consider in determining willfulness include (but are not limited to" whether the defendant "intentionally copied" the patent, "reasonably believed it did not infringe or that the patent was invalid, . . made a good-faith effort to avoid infringing the [] patent" and/or attempted "to cover up its infringement." Id. at 1377-78.

Defendants assert three reasons why Penn's claim of willful infringement fails as a matter of law: (1) "Penn represented to the Court that, until 2018, the art did not recognize that" Erbitux infringed Claim 13; (2) Defendants had "a reasonable belief Claim 13 is invalid;" and (3) "Penn has adduced no evidence of actions by Defendants of the type that have historically supported enhanced damages." (Doc. No. 182 at 5-9.)

First, Defendants point to Penn's previous statement that, until publication of Fournier in April of 2018, it did not know Erbitux infringed Claim 13. (Id. at 5.) Defendants argue that this

demonstrates there was no basis to believe Defendants knew they were willfully causing infringement of Claim 13. (Id. at 6.) Penn's expert explains that ImClone scientist Dr. Patel's laboratory notebooks demonstrate that Defendants had knowledge that Erbitux infringed Claim 13. (Doc. No. 213, Exh. 51 at ¶ 18.) As I have discussed, however, taking this evidence in the light most favorable to Penn, a jury could reasonably infer that Defendants knew Erbitux infringed Claim 13.

Defendants next assert that they had a reasonable belief that Claim 13 was invalid. (Doc. No. 182 at 6.) Defendants instituted an IPR at the USPTO, which invalidated most of the '558 Patent claims—most notably Claim 11, from which Claim 13 depends—as being obvious. (Doc. No. 23.) Defendants assert they clearly had a reasonable belief that Claim 13 would be invalid for the same reasons. (Doc. No. at 7-8.) Defendants further point to their Motion for Summary Judgment, which includes their arguments that Claim 13 is invalid as failing to comply with the enablement and written description requirements, as evidence of their reasonable belief of invalidity. (Doc. No. 180.)

"[T]he appropriate time frame for considering culpability is by assessing the infringer's knowledge at the time of the challenged conduct." WBIP, LLC v. Kohler Co., 829 F.3d 1317, 1340 (Fed. Cir. 2016). Here, the alleged infringement occurred as of 2009 when the '558 Patent issued. (Doc. No. 1. ¶¶ 14, 22.) Defendants filed their petition for IPR on January 14, 2016, the day after Penn filed its Complaint alleging infringement. Defendants filed their Motion of Summary Judgement for invalidity on November 13, 2020. (Doc. No. 180.) Neither filing demonstrates Defendants' intent in 2009, the time of the challenged conduct.

Finally, Defendants argue that Penn has failed to identify "'any egregious conduct or evidence of behavior beyond typical infringement' by the defendant" which supports a finding of

willful infringement. (Doc. No. 182 at 8-9.) Yet, the "considerations of egregious behavior and punishment are relevant" only to the determination of whether enhanced damages should be imposed. Eko Brands, 946 F.3d at 1378. "Enhanced damages [are] addressed by the court once an affirmative finding of willfulness has been made." Id. Accordingly, Defendants argument that Penn has failed to identify "any egregious conduct or evidence of behavior beyond typical infringement" is irrelevant to whether there was willful infringement.

Viewing these facts in the light most favorable to Penn, a jury could reasonably infer that Defendants knew Erbitux infringed Claim 13. If so, the jury could also find that Defendants intentionally or deliberately infringed the '558 Patent. Accordingly, I will not grant Defendants' Partial Motion for Summary Judgment of No Willful Infringement.

IV. CONCLUSION

AND NOW, this 19th day of November, 2021, upon consideration of Defendants' Motions for Summary Judgment (Doc. Nos. 180, 181, 182), Penn's Responses (Doc. Nos. 208, 209, 210), Defendants' Replies (Doc. Nos. 223, 224), Penn's Sur-Replies (Doc. Nos. 239, 241, 242), Defendants' Notice of Supplemental Authority (Doc Nos. 263, 267, 335), Penn's Response to Notice of Supplemental Authority (Doc. Nos. 264, 337), and the entirety of the record, it is **hereby ORDERED** that Defendants' Motions (Doc. Nos. 180, 181, 182) are **DENIED**.

AND IT IS SO ORDERED.

/s/ Paul S. Diamond

Paul S. Diamond, J.